Volume 3 Issue 4, March 2015

International Journal of Inventive Engineering and Sciences

ISSN: 2319-9598

website: www.ijies.org





Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd. Exploring Innovation: A Key for Dedicated Services

Address:

22, First Floor, ShivLoke Phase-IV,

Khajuri Kala, BHEL-Piplani, Bhopal (M.P.)-462021, India

Website: www.blueeyesintelligence.org

Email: director@blueeyesintelligence.org, blueeyes@gmail.com

Cell #: +91-9669981618, WhatsApp #: +91-9669981618, Viber #: +91-9669981618

Skype #: beiesp, Twitter #: beiesp

Editor In Chief

Dr. Shiv K Sahu

Ph.D. (CSE), M.Tech. (IT, Honors), B.Tech. (IT)

Director, Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd., Bhopal(M.P.), India

Dr. Shachi Sahu

Ph.D. (Chemistry), M.Sc. (Organic Chemistry)

Additional Director, Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd., Bhopal(M.P.), India

Vice Editor In Chief

Dr. Himani Sharma

Professor & Dean, Department of Electronics & Communication Engineering, MLR Institute of Technology, Laxman Reddy Avenue, Dundigal, Hyderabad, India

Prof.(Dr.) Anuranjan Misra

Professor & Head, Computer Science & Engineering and Information Technology & Engineering, Noida International University, Noida (U.P.), India

Chief Advisory Board

Prof. (Dr.) Hamid Saremi

Vice Chancellor of Islamic Azad University of Iran, Quchan Branch, Quchan-Iran

Dr. Uma Shanker

Professor & Head, Department of Mathematics, CEC, Bilaspur(C.G.), India

Dr. Rama Shanker

Professor & Head, Department of Statistics, Eritrea Institute of Technology, Asmara, Eritrea

Dr. Vinita Kumari

Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd., India

Dr. Kapil Kumar Bansal

Head (Research and Publication), SRM University, Gaziabad (U.P.), India

Dr. Deepak Garg

Professor, Department of Computer Science and Engineering, Thapar University, Patiala (Punjab), India, Senior Member of IEEE, Secretary of IEEE Computer Society (Delhi Section), Life Member of Computer Society of India (CSI), Indian Society of Technical Education (ISTE), Indian Science Congress Association Kolkata.

Dr. Vijay Anant Athavale

Director of SVS Group of Institutions, Mawana, Meerut (U.P.) India/ U.P. Technical University, India

Dr. T.C. Manjunath

Principal & Professor, HKBK College of Engg, Nagawara, Arabic College Road, Bengaluru-560045, Karnataka, India

Dr. Kosta Yogeshwar Prasad

Director, Technical Campus, Marwadi Education Foundation's Group of Institutions, Rajkot-Morbi Highway, Gauridad, Rajkot, Gujarat, India

Dr. Dinesh Varshney

Director of College Development Counceling, Devi Ahilya University, Indore (M.P.), Professor, School of Physics, Devi Ahilya University, Indore (M.P.), and Regional Director, Madhya Pradesh Bhoj (Open) University, Indore (M.P.), India

Dr. P. Dananjayan

Professor, Department of Department of ECE, Pondicherry Engineering College, Pondicherry, India

Dr. Sadhana Vishwakarma

Associate Professor, Department of Engineering Chemistry, Technocrat Institute of Technology, Bhopal(M.P.), India

Dr. Kamal Mehta

Associate Professor, Deptment of Computer Engineering, Institute of Technology, NIRMA University, Ahmedabad (Gujarat), India

Dr. CheeFai Tan

Faculty of Mechanical Engineering, University Technical, Malaysia Melaka, Malaysia

Dr. Suresh Babu Perli

Professor & Head, Department of Electrical and Electronic Engineering, Narasaraopeta Engineering College, Guntur, A.P., INDIA

Dr. Binod Kumar

Associate Professor, Schhool of Engineering and Computer Technology, Faculty of Integrative Sciences and Technology, Quest International University, Ipoh, Perak, Malaysia

Dr. Chiladze George

Professor, Faculty of Law, Akhaltsikhe State University, Tbilisi University, Georgia

Dr. Kavita Khare

Professor, Department of Electronics & Communication Engineering., MANIT, Bhopal (M.P.), INDIA

Dr. C. Saravanan

Associate Professor (System Manager) & Head, Computer Center, NIT, Durgapur, W.B. India

Dr. S. Sarayanan

Professor, Department of Electrical and Electronics Engineering, Muthayamal Engineering College, Resipuram, Tamilnadu, India

Dr. Amit Kumar Garg

Professor & Head, Department of Electronics and Communication Engineering, Maharishi Markandeshwar University, Mulllana, Ambala (Haryana), India

Dr. T.C.Manjunath

Principal & Professor, HKBK College of Engg, Nagawara, Arabic College Road, Bengaluru-560045, Karnataka, India

Dr. P. Dananjavan

Professor, Department of Department of ECE, Pondicherry Engineering College, Pondicherry, India

Dr. Kamal K Mehta

Associate Professor, Department of Computer Engineering, Institute of Technology, NIRMA University, Ahmedabad (Gujarat), India

Dr. Rajiv Srivastava

Director, Department of Computer Science & Engineering, Sagar Institute of Research & Technology, Bhopal (M.P.), India

Dr. Chakunta Venkata Guru Rao

Professor, Department of Computer Science & Engineering, SR Engineering College, Ananthasagar, Warangal, Andhra Pradesh, India

Dr. Anuranian Misra

Professor, Department of Computer Science & Engineering, Bhagwant Institute of Technology, NH-24, Jindal Nagar, Ghaziabad, India

Dr. Robert Brian Smith

International Development Assistance Consultant, Department of AEC Consultants Pty Ltd, AEC Consultants Pty Ltd, Macquarie Centre, North Ryde, New South Wales, Australia

Dr. Saber Mohamed Abd-Allah

Associate Professor, Department of Biochemistry, Shanghai Institute of Biochemistry and Cell Biology, Yue Yang Road, Shanghai, China

Dr. Himani Sharma

Professor & Dean, Department of Electronics & Communication Engineering, MLR Institute of Technology, Laxman Reddy Avenue, Dundigal, Hyderabad, India

Dr. Sahab Singh

Associate Professor, Department of Management Studies, Dronacharya Group of Institutions, Knowledge Park-III, Greater Noida, India

Dr. Umesh Kumar

Principal: Govt Women Poly, Ranchi, India

Dr. Syed Zaheer Hasan

Scientist-G Petroleum Research Wing, Gujarat Energy Research and Management Institute, Energy Building, Pandit Deendayal Petroleum University Campus, Raisan, Gandhinagar-382007, Gujarat, India.

Dr. Jaswant Singh Bhomrah

Director, Department of Profit Oriented Technique, 1 – B Crystal Gold, Vijalpore Road, Navsari 396445, Gujarat. India

Technical Advisory Board

Dr. Mohd. Husain

Director. MG Institute of Management & Technology, Banthara, Lucknow (U.P.), India

Dr. T. Jayanthy

Principal. Panimalar Institute of Technology, Chennai (TN), India

Dr. Umesh A.S.

Director, Technocrats Institute of Technology & Science, Bhopal(M.P.), India

Dr. B. Kanagasabapathi

Infosys Labs, Infosys Limited, Center for Advance Modeling and Simulation, Infosys Labs, Infosys Limited, Electronics City, Bangalore, India

Dr. C.B. Gupta

Professor, Department of Mathematics, Birla Institute of Technology & Sciences, Pilani (Rajasthan), India

Dr. Sunandan Bhunia

Associate Professor & Head,, Dept. of Electronics & Communication Engineering, Haldia Institute of Technology, Haldia, West Bengal, India

Dr. Jaydeb Bhaumik

Associate Professor, Dept. of Electronics & Communication Engineering, Haldia Institute of Technology, Haldia, West Bengal, India

Dr. Rajesh Das

Associate Professor, School of Applied Sciences, Haldia Institute of Technology, Haldia, West Bengal, India

Dr. Mrutyunjaya Panda

Professor & Head, Department of EEE, Gandhi Institute for Technological Development, Bhubaneswar, Odisha, India

Dr. Mohd. Nazri Ismail

Associate Professor, Department of System and Networking, University of Kuala (UniKL), Kuala Lumpur, Malaysia

Dr. Haw Su Cheng

Faculty of Information Technology, Multimedia University (MMU), Jalan Multimedia, 63100 Cyberjaya

Dr. Hossein Rajabalipour Cheshmehgaz

Industrial Modeling and Computing Department, Faculty of Computer Science and Information Systems, Universiti Teknologi Malaysia (UTM) 81310, Skudai, Malaysia

Dr. Sudhinder Singh Chowhan

Associate Professor, Institute of Management and Computer Science, NIMS University, Jaipur (Rajasthan), India

Dr. Neeta Sharma

Professor & Head, Department of Communication Skils, Technocrat Institute of Technology, Bhopal(M.P.), India

Dr. Ashish Rastogi

Associate Professor, Department of CSIT, Guru Ghansi Das University, Bilaspur (C.G.), India

Dr. Santosh Kumar Nanda

Professor, Department of Computer Science and Engineering, Eastern Academy of Science and Technology (EAST), Khurda (Orisa), India

Dr. Hai Shanker Hota

Associate Professor, Department of CSIT, Guru Ghansi Das University, Bilaspur (C.G.), India

Dr. Sunil Kumar Singla

Professor, Department of Electrical and Instrumentation Engineering, Thapar University, Patiala (Punjab), India

Dr. A. K. Verma

Professor, Department of Computer Science and Engineering, Thapar University, Patiala (Punjab), India

Dr. Durgesh Mishra

Chairman, IEEE Computer Society Chapter Bombay Section, Chairman IEEE MP Subsection, Professor & Dean (R&D), Acropolis Institute of Technology, Indore (M.P.), India

Dr. Xiaoguang Yue

Associate Professor, College of Computer and Information, Southwest Forestry University, Kunming (Yunnan), China

Dr. Veronica Mc Gowan

Associate Professor, Department of Computer and Business Information Systems, Delaware Valley College, Doylestown, PA, Allman China

Dr. Mohd. Ali Hussain

Professor, Department of Computer Science and Engineering, Sri Sai Madhavi Institute of Science & Technology, Rajahmundry (A.P.), India

Dr. Mohd. Nazri Ismail

Professor, System and Networking Department, Jalan Sultan Ismail, Kaula Lumpur, MALAYSIA

Dr. Sunil Mishra

Associate Professor, Department of Communication Skills (English), Dronacharya College of Engineering, Farrukhnagar, Gurgaon (Haryana), India

Dr. Labib Francis Gergis Rofaiel

Associate Professor, Department of Digital Communications and Electronics, Misr Academy for Engineering and Technology, Mansoura City, Egypt

Dr. Pavol Tanuska

Associate Professor, Department of Applied Informetics, Automation, and Mathematics, Trnava, Slovakia

Dr. VS Giridhar Akula

Professor, Avanthi's Research & Technological Academy, Gunthapally, Hyderabad, Andhra Pradesh, India

Dr. S. Satyanarayana

Associate Professor, Department of Computer Science and Engineering, KL University, Guntur, Andhra Pradesh, India

Dr. Bhupendra Kumar Sharma

Associate Professor, Department of Mathematics, KL University, BITS, Pilani, India

Dr. Praveen Agarwal

Associate Professor & Head, Department of Mathematics, Anand International College of Engineering, Jaipur (Rajasthan), India

Dr. Manoj Kumar

Professor, Department of Mathematics, Rashtriya Kishan Post Graduate Degree, College, Shamli, Prabudh Nagar, (U.P.), India

Dr. Shaikh Abdul Hannan

Associate Professor, Department of Computer Science, Vivekanand Arts Sardar Dalipsing Arts and Science College, Aurangabad (Maharashtra), India

Dr. K.M. Pandey

Professor, Department of Mechanical Engineering, National Institute of Technology, Silchar, India

Prof. Pranav Parashar

Technical Advisor, International Journal of Soft Computing and Engineering (IJSCE), Bhopal (M.P.), India

Dr. Biswajit Chakraborty

MECON Limited, Research and Development Division (A Govt. of India Enterprise), Ranchi-834002, Jharkhand, India

Dr. D.V. Ashoka

Professor & Head, Department of Information Science & Engineering, SJB Institute of Technology, Kengeri, Bangalore, India

Dr. Sasidhar Babu Suvanam

Professor & Academic Cordinator, Department of Computer Science & Engineering, Sree Narayana Gurukulam College of Engineering, Kadayiuruppu, Kolenchery, Kerala, India

Dr. C. Venkatesh

Professor & Dean, Faculty of Engineering, EBET Group of Institutions, Kangayam, Erode, Caimbatore (Tamil Nadu), India

Dr. Nilay Khare

Assoc. Professor & Head, Department of Computer Science, MANIT, Bhopal (M.P.), India

Dr. Sandra De Iaco

Professor, Dip.to Di Scienze Dell'Economia-Sez. Matematico-Statistica, Italy

Dr. Yaduvir Singh

Associate Professor, Department of Computer Science & Engineering, Ideal Institute of Technology, Govindpuram Ghaziabad, Lucknow (U.P.), India

Dr. Angela Amphawan

Head of Optical Technology, School of Computing, School Of Computing, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia

Dr. Ashwini Kumar Arya

Associate Professor, Department of Electronics & Communication Engineering, Faculty of Engineering and Technology, Graphic Era University, Dehradun (U.K.), India

Dr. Yash Pal Singh

Professor, Department of Electronics & Communication Engg, Director, KLS Institute Of Engg. & Technology, Director, KLSIET, Chandok, Bijnor, (U.P.), India

Dr. Ashish Jain

Associate Professor, Department of Computer Science & Engineering, Accurate Institute of Management & Technology, Gr. Noida (U.P.), India

Dr. Abhay Saxena

Associate Professor&Head, Department. of Computer Science, Dev Sanskriti University, Haridwar, Uttrakhand, India

Dr. Judy. M.V

Associate Professor, Head of the Department CS &IT, Amrita School of Arts and Sciences, Amrita Vishwa Vidyapeetham, Brahmasthanam, Edapally, Cochin, Kerala, India

Dr. Sangkyun Kim

Professor, Department of Industrial Engineering, Kangwon National University, Hyoja 2 dong, ChuncheOnsi, Gangwondo, Korea

Dr. Sanjay M. Gulhane

Professor, Department of Electronics & Telecommunication Engineering, Jawaharlal Darda Institute of Engineering & Technology, Yavatmal, Maharastra, India

Dr. K.K. Thyagharajan

Principal & Professor, Department of Informational Technology, RMK College of Engineering & Technology, RSM Nagar, Thiruyallur, Tamil Nadu, India

Dr. P. Subashini

Assoc. Professor, Department of Computer Science, Coimbatore, India

Dr. G. Srinivasrao

Professor, Department of Mechanical Engineering, RVR & JC, College of Engineering, Chowdayaram, Guntur, India

Dr. Rajesh Verma

Professor, Department of Computer Science & Engg. and Deptt. of Information Technology, Kurukshetra Institute of Technology & Management, Bhor Sadian, Pehowa, Kurukshetra (Haryana), India

Dr. Pawan Kumar Shukla

Associate Professor, Satya College of Engineering & Technology, Haryana, India

Dr. U C Srivastava

Associate Professor, Department of Applied Physics, Amity Institute of Applied Sciences, Amity University, Noida, India

Dr. Reena Dadhich

Prof. & Head, Department of Computer Science and Informatics, MBS MArg, Near Kabir Circle, University of Kota, Rajasthan, India

Dr. Aashis. S. Roy

Department of Materials Engineering, Indian Institute of Science, Bangalore Karnataka, India

Dr. Sudhir Nigam

Professor Department of Civil Engineering, Principal, Lakshmi Narain College of Technology and Science, Raisen, Road, Bhopal, (M.P.), India

Dr. S. Senthil Kumar

Doctorate, Department of Center for Advanced Image and Information Technology, Division of Computer Science and Engineering, Graduate School of Electronics and Information Engineering, Chon Buk National University Deok Jin-Dong, Jeonju, Chon Buk, 561-756, South Korea Tamilnadu, India

Dr. Gufran Ahmad Ansari

Associate Professor, Department of Information Technology, College of Computer, Qassim University, Al-Qassim, Kingdom of Saudi Arabia (KSA)

Dr. R. Navaneetha krishnan

Associate Professor, Department of MCA, Bharathiyar College of Engg & Tech, Karaikal Puducherry, India

Dr. Hossein Rajabalipour Cheshmejgaz

Industrial Modeling and Computing Department, Faculty of Computer Science and Information Systems, Universiti Teknologi Skudai, Malaysia

Dr. Veronica McGowan

Associate Professor, Department of Computer and Business Information Systems, Delaware Valley College, Doylestown, PA, Allman China

Dr. Sanjay Sharma

Associate Professor, Department of Mathematics, Bhilai Institute of Technology, Durg, Chhattisgarh, India

Dr. Taghreed Hashim Al-Noor

Professor, Department of Chemistry, Ibn-Al-Haitham Education for pure Science College, University of Baghdad, Iraq

Dr. Madhumita Dash

Professor, Department of Electronics & Telecommunication, Orissa Engineering College, Bhubaneswar, Odisha, India

Dr. Anita Sagadevan Ethiraj

Associate Professor, Department of Centre for Nanotechnology Research (CNR), School of Electronics Engineering (Sense), Vellore Institute of Technology (VIT) University, Tamilnadu, India

Dr. Sibasis Acharya

Project Consultant, Department of Metallurgy & Mineral Processing, Midas Tech International, 30 Mukin Street, Jindalee-4074, Queensland, Australia

Dr. Neelam Ruhil

Professor, Department of Electronics & Computer Engineering, Dronacharya College of Engineering, Gurgaon, Haryana, India

Dr. Faizullah Mahar

Professor, Department of Electrical Engineering, Balochistan University of Engineering and Technology, Pakistan

Dr. K. Selvaraju

Head, PG & Research, Department of Physics, Kandaswami Kandars College (Govt. Aided), Velur (PO), Namakkal DT. Tamil Nadu, India

Dr. M. K. Bhanarkar

Associate Professor, Department of Electronics, Shivaji University, Kolhapur, Maharashtra, India

Dr. Sanjay Hari Sawant

Professor, Department of Mechanical Engineering, Dr. J. J. Magdum College of Engineering, Jaysingpur, India

Dr. Arindam Ghosal

Professor, Department of Mechanical Engineering, Dronacharya Group of Institutions, B-27, Part-III, Knowledge Park, Greater Noida, India

Dr. M. Chithirai Pon Selvan

Associate Professor, Department of Mechanical Engineering, School of Engineering & Information Technology Manipal University, Dubai, UAE

Dr. S. Sambhu Prasad

Professor & Principal, Department of Mechanical Engineering, Pragati College of Engineering, Andhra Pradesh, India.

Dr. Muhammad Attique Khan Shahid

Professor of Physics & Chairman, Department of Physics, Advisor (SAAP) at Government Post Graduate College of Science, Faisalabad.

Dr. Kuldeep Pareta

Professor & Head, Department of Remote Sensing/GIS & NRM, B-30 Kailash Colony, New Delhi 110 048, India

Dr. Th. Kiranbala Devi

Associate Professor, Department of Civil Engineering, Manipur Institute of Technology, Takyelpat, Imphal, Manipur, India

Dr. Nirmala Mungamuru

Associate Professor, Department of Computing, School of Engineering, Adama Science and Technology University, Ethiopia

Dr. Srilalitha Girija Kumari Sagi

Associate Professor, Department of Management, Gandhi Institute of Technology and Management, India

Dr. Vishnu Narayan Mishra

Associate Professor, Department of Mathematics, Sardar Vallabhbhai National Institute of Technology, Ichchhanath Mahadev Dumas Road, Surat (Gujarat), India

Dr. Yash Pal Singh

Director/Principal, Somany (P.G.) Institute of Technology & Management, Garhi Bolni Road, Rewari Haryana, India.

Dr. Sripada Rama Sree

Vice Principal, Associate Professor, Department of Computer Science and Engineering, Aditya Engineering College, Surampalem, Andhra Pradesh, India.

Dr. Rustom Mamlook

Associate Professor, Department of Electrical and Computer Engineering, Dhofar University, Salalah, Oman. Middle East.

Managing Editor

Mr. Jitendra Kumar Sen

International Journal of Inventive Engineering and Sciences (IJIES)

Editorial Board

Dr. Vikas Maheshwari

Associate Professor, Department of Electrical Communication Engineering, Amity University Madhya-Pradesh Gwalior, M.P., India

Dr. Sudhakara A

Associate Professor, Department of Chemistry, Jain Institute of Technology Davanagere, Karnataka, India

Dr. Jammi Ashok

Associate Professor, Department of Electrical and Computer Engineering, Hawassa University, Hawassa. (East Africa)

Dr. Mohamed Ashabrawy

Associate Professor, Department of Computer Science, Salman bin Abdulaziz University Kingdom, Saudi Arabia

Dr. Omer Muhammad Ayoub

Associate Professor, Department of Computer Science, Punjab University Affected Center Abdullah Sulayman Road, Al-Fayyaz, Jeddah, KSA Saudi Arabia

Dr. M. Seenivasan

Associate Professor, Department of Mathematics, Annamalai University Annamalainagar, Tamil Nadu, India

Dr. S.V.G.V.A. Prasad

Associate Professor, Department of Physics, Ideal College of Arts & Sciences, Kakinada, A.P, India.

Dr. S. Omkumar

Associate Professor, Department of Electronics and Communication Engineering, SCSVMV University, Enathur, Kanchipuram -631 561. Tamilnadu, India.

Dr. Yousef FARHAOUI

Associate Professor, Department of Computer Science, Faculty of Sciences and Technic, Moulay Ismail University, B.P 509, Boutalamine, Errachidia, Morocco.

Dr. Gutta Sridevi

Associate Professor, Department of Computer Science & Engineering, K L University, Vaddeswaram, Guntur (DT) Andhra Pradesh. India.

Dr. Debmalya Bhattacharya

Associate Professor, Department of Electronics & Communication Engineering, University of Technology & Management, Bawri Mansion, Dhankheti, Shillong-793003, Meghalaya, India.

Dr. K. Harinadha Reddy

Associate Professor, Department of Electrical and Electronics Engineering, L B R College of Engineering, Mylavaram, Krishna District, Andhra Pradesh State - 5 21 230, India.

Dr. C. Gajendran

Associate Professor, Department of Civil Engineering, School of Civil Engineering, Karunya Nagar, Karunya University, Coimbatore – 641114, Tamil Nadu, India.

Dr. Dibya Prakash Rai

Assistant Professor, Department of Physics, College of Aizawl, Pachhunga University, Mizoram, India.

Dr. Sreenivasa Reddy

Associate Professor, Department of Chemistry, Sri Krishnadevaraya University, Anantapur-515003, A.P., India.

Dr. P. K. Dhal

Associate Professor, Department of Electrical and Electronics Engineering, Vel Tech, Dr. RR & Dr. SR Technical University, Chennai, India.

Dr. M. A. Ashabrawy

Associate Professor, Department of Computer Science, Atomic Energy Authority, Salman bin Abdulaziz University, Al Kharj Saudi Arabia.

Dr. K. Meenakshi Sundaram

Professor & Head, Department of Computer Science, Agnel Institute of Technology and Design, Assagao - Bardez, Goa. India.

Dr. Persis Voola

Associate Professor, Department of Computer Science and Engineering, Adikavi Nannaya University, Rajah Narendra Nagar, Rajahmundry-533296 Andhra Pradesh, India.

Dr. Abhijit Banerjee

Associate Professor, Department of Electronics and Instrumentation Engineering, Academy of Technology, Hooghly, Grand Trunk Rd, Adisaptagram, Aedconagar, West Bengal, India.

Dr. D. Amaranatha Reddy

Associate Professor, Department of Chemistry, Pusan National University, Busan, South Korea.

Dr. A. Heidari

Associate Professor, Department of Chemistry, Postdoctoral Research Fellow, California South University (CSU), Irvine, California, USA

Dr. Ashwani Kumar Aggarwal

Assistant Professor, Department of Electrical and Instrumentation Engineering, Sant Longowal Institute of Engineering and Technology, Longowal, Punjab, India.

Dr. P. Srinivas

Assistant Professor, Department of Electrical Engineering, University College of Engineering Osmania University, Hyderabad-500007, Telangana, India.

Dr. Sandeep Chettri

DST-SERB, Young Scientist, Department of Physics, Mizoram University, Tanhril, Aizawl, Mizoram 796004, India.

Dr. Elsanosy M. Elamin

Assistant Professor, Department of Electrical and Electronic Engineering, Faculty of Engineering, University of Kordofan B.O.Box: 160 Elobeid, (Sudan). North Africa.

Dr. Porag Kalita

Professor & Head, Department of Automobile Engineering, Jorhat, Assam, India.

Dr. T. A. Ashok Kumar

Associate Professor, Department of Computer Science, Christ University, Bengaluru, Karnataka, India.

Dr. Malini M Patil

Associate Professor, Department of Information Science and Engineering, JSS Academy of Technical Education, JSS Campus, Bangalore-560060, Karnataka, India.

Dr. V. Selvar

Associate Professor, Department of Civil Engineering, Sri Ramakrishna Engineering College, Vattamalaipalayam, Coimbatore, Tamil Nadu, India.

Dr. Syed Umar

Associate Professor, Department of Computer Science and Engineering, Koneru Lakshmaiah University, Vaddeswaram, Guntur, Andhra Pradesh, India.

S. No	Volume-3 Issue-4, March 2015, ISSN: 2319-9598 (Online) Published By: Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd.							
	Authors:	nors: U. K. Kulkarni, K. V. Kulkarni, D. V. Mane, R. K. Pardeshi						
	Paper Title: New Chromogenic Spray Reeagent for Detection of Acephate from Biological Material							
1.	Abstract: High performance thin layer chromatography has found wide recognition in many fields and in sensitivity of detection offers particular advantage to the toxicologist, which has increased, 10 to 100 times as compared to the chemical method. It has become an important analytical tool since it can separate complex mixture in a relatively short time. In existing study, an effort has been taken to determine organ phosphorus insecticide Acephate by using high performance thin layer chromatography. A new specific Sensitive chromogenic reagent 0.1% solution of ferric chloride in 80% ethanol and 1 % Sulfosalicylic acid in 80% ethanol has been developed for detection of Acephate an organophosphorus insecticide with solvent system petroleum ether: methanol (95: 5).							
	 Kawale G.B. and Joglekar V.S., Current Science, 1976:45(2);57 Lanjewar R.B., Chutke N.L. Specific Chromogenic reagent for detection of Profenophos in Biological sample by HPTLC, J of Science & Engg., 2010, Vol(2);60-62 							
	Authors:	Ahmed Mudassar Ali, M. Ramakrishna						
	Paper Title:	A Novel Approach for Knowledge Extraction Using Ontology Construction Method						
	Abstract: In reco	ent research, Ontology construction plays a major role for transforming raw texts into useful						

Abstract: In recent research, Ontology construction plays a major role for transforming raw texts into useful knowledge. It reduces the difficulties in understanding the information and semantic interpretation. The proposed method in this paper supports efficient construction of ontology and applies efficient method to train the data before taking into testing process. The proposed approach uses the phrase-pairs to extract useful knowledge and uses data mining techniques and neural network approach to express the knowledge well and also it improves the search speed and accuracy of information retrieval. This method avoids noise generation by analyzing the relevancy of tags to the retrieval process and shows somewhat better recall value compared to other methods. In this approach an optimized reasoners is applied to reduce complexity in the key inference problem. The formulated ontology can help clearly expressing its meaning for various concepts and relations. Due to the increasing size of ontology repository, the matching process may take more time. To avoid this, this method forms a hierarchical structure with semantic interpretation of data. The system is designed to extract useful knowledge from data sources that are constructed by collecting data from diverse sources.

Keywords: Back propagation, domain ontology, knowledge extraction, information retrieval, agricultural environment.

References:

2.

- 1. Aree Thunkijjanukij, Asanee Kawtrakul, Supamard Panichsakpatana, Uamporn Veesommai, "Lesson learned for ontology construction with Thai rice case study", "in press". World Conference on agricultural information and IT", 2008, Pages: 495-502.
- 2. WEN Bi-long, HANG Li,"Method of building petroleum exploration and production domain ontology", "in press" Computer Engineering and Applications, 2009.45(034):p.1-3.
- 3. Zhang Rui-ling, XU Hong-sheng, "Using Bayesian network and neural network constructing domain ontology", "in press" World Congress on Computer Science and Information Engineering, 2009, IEEE 2008, Pages: 116-231.
- Guarino.N, "Formal ontology in information systems", "in press" 1998. Proceedings of IOS.
- 5. Elena P. Sapozhnikova," Multi-label classification with art neural networks", "in press" Second International Workshop on Knowledge Discovery and Data Mining, 2009 IEEE, Pages: 144-147.
- Xin-fu LI, lei-lei ZHAO, li-hong WU,"A feature extraction method using base phrase and keyword in Chinese text", "in press" Proceedings of 2008 3rd International Conference on Intelligent System and Knowledge Engineering, Pages: 680-685, 2008 IEEE.
- Shubin Zhao Ralph Grishman," Extracting Relations with Integrated Information Using Kernel Methods", "in press" Proceedings of the 43rd Annual Meeting of the ACL, pages 419–426, Ann Arbor, June 2005.
- 8. A.Nag!, S. Biswas*, D. Sarkar*, P.P. Sarkar*, B. Gupta**, "A Simple Feature Extraction Technique of a Pattern By Hopfield Network", "in press" International Journal of Advancements in Technology, ISSN 0976-4860, Vol 1, No 1 (June 2010),pages:45-49.
- Hongbo Liu1, 3, Ajith Abraham2, and Benxian Yue3," Nature Inspired Multi-Swarm Heuristics for Multi-Knowledge Extraction", "in press" Advances in Machine Learning II, pp. 445–466, 2010.
- Spyns,P.,"EvaLexon: Assessing triples mined from texts". Technical Report 09,STAR Lab, Brussels, Belgium, 2005.
- 11. Velardi, P., et al., "Evaluation of OntoLearn, a methodology for automatic learning of domain ontologies. In: Ont. Learning from Text: Methods", Evaluation and Applications, IOS Press, 2005.
- 12. Weng, S., Tsai, H, Liu, S., and Hsu, C.,, "Ontology Construction for information classification, Expert Systems with Applications", 31(1),1-12.
- 13. Christine W. Chan, 2004. From Knowledge Modeling to Ontology Construction. International Journal of Software Engineering and Knowledge Engineering (IJSEKE).
- Gaoying Cui, Qin Lu, Wenjie Li, Yirong Chen. Corpus Exploitation from Wikipedia for Ontology Construction: 2125-2132
- 15. Chen-Huei Chou, Fatemeh Zahedi, Huimin Zhoa, 2008. Ontology for developing websites for natural disaster management: methodology and implementation.
- Harith Alani, 2006. Position paper: Ontology construction from online ontologies. Proceedings of the 15th international conference on World Wide Web: 491 - 495.
- 17. Antonio M. Rinaldi, 2009. An Ontology-Driven Approach for Semantic Information Retrieval on the Web. In ACM Transactions on Internet

Technologies, Volume 9, Article 10.

18. Xu Binfeng, Luo, Xiaogang Peng Cenglin, Huang Qian, 2007. Based on ontology: construction and application of medical knowledge base. IEEE International conference on complex medical engineering: 586-589.

Authors: J. Thirumaran, S. Dhinakaran

Paper Title: Nano-Robotics in Medical Applications-Ventilons

Abstract: Nano Robotics is a field under continuous development. It involves the construction of robots of the size of 10^-9m. In the last decade many nano robots have made their way out of the drawing boards to enter into the human body and do things beyond human imagination. Symptoms like itching and fever have certain biochemical causes which can be eliminated by injecting nano robots. In this technological era of development our paper acts as a beacon for scientists and research scholars. Our paper mainly concentrates on creating nano robots that mimic the action of RBC's. These nano robots are called as Ventilons. Our paper also concentrates on future trends of nano robotics like implementing nano robots to detect human physiology. The second part of our paper deals with introducing nanosensors and nano-robots in detecting Human blood sugar level. These nano-robots are embedded with mobile phones and the status of the patient can be read from remote places. These nano particles that reduce the size of microelectronic components will cover the entire world inside a single chip.

Keywords: Nano-robots, nano sensors, ventilons, nano technology, nano-medicine.

References:

3.

1. Wang, J. (2009). "Can Man-Made Nanomachines Compete with Nature Biomotors?". ACS Nano 3 (1): 4–9.

- Fisher, B. (2008). "Biological Research in the Evolution of Cancer Surgery: A Personal Perspective". Cancer Research 68 (24): 10007–10020.
- 3. Cavalcanti, A., Shirinzadeh, B., Zhang, M. & Kretly, L.C. (2008). "Nanorobot Hardware Architecture for Medical Defense". Sensors 8 (5): 2932–2958.
- 4. Hill, C., Amodeo, A., Joseph, J.V. & Patel, H.R.H. (2008). "Nano- and microrobotics: how far is the reality?". Expert Review of Anticancer Therapy 8 (12): 1891–1897.
- 5. Cale, T.S., Lu, J.-Q. & Gutmann, R.J. (2008). "Three-dimensional integration in microelectronics: Motivation, processing, and thermomechanical modeling". Chemical Engineering Communications 195 (8): 847–888.
- 6. Couvreur, P. & Vauthier, C. (2006). "Nanotechnology: Intelligent Design to Treat Complex Disease". Pharmaceutical Research 23 (7): 1417–1450.
- 7. Elder, J.B., Hoh, D.J., Oh, B.C., Heller, A.C., Liu, C.Y. & Apuzzo, M.L. (2008). "The future of cerebral surgery: a kaleidoscope of opportunities". Neurosurgery 62 (6): 1555–1579.
- Martel, S., Mohammadi, M., Felfoul, O., Lu, Z. & Pouponneau P. (2009). "Flagellated Magnetotactic Bacteria as Controlled MRItrackable Propulsion and Steering Systems for Medical Nanorobots Operating in the Human Microvasculature". International Journal of Robotics Research 28 (4): 571–582.
- Cavalcanti, A. (2009). "Nanorobot Invention and Linux: The Open Technology Factor An Open Letter to UNO General Secretary". CANNXS Project 1
- Vaughn JR. (2006). "Over the Horizon: Potential Impact of Emerging Trends in Information and Communication Technology on Disability Policy and Practice". National Council on Disability, Washington DC.: 1–55.

Authors: V. S. Malunjkar, M. G. Shinde, S. S. Ghotekar, A. A. Atre

Paper Title: Estimation of Surface Runoff using SWAT Model

Abstract: Runoff is a very important phenomenon of hydrological cycle and it is relevant for the watershed management programme for conservation and development or natural resources and its management. However, In India the availability of accurate information on runoff is scarce. Soil and Water Assessment Tool (SWAT) is a physically based distributed parameter model which has been developed to predict runoff, erosion, sediment and nutrient transport from agricultural watersheds under different management practices. For the present study, a small agricultural watershed has been selected for runoff assessment. Geoinformatic techniques such as ERDAS software and Shuttle Radar Topographic Mission (SRTM) data are used for execution of the model. Calibration of the model is done with the help of observed data and then it is validated on selected study area. For calibration and validation, daily observed runoff data of 1997 and 1998 were used. It is found from the results that, Nash and Sutcliffe efficiency was 0.62 and 0.74 respectively and coefficient of determination was 0.98 and 0.95 respectively for calibration and validation period.

Keywords: Hydrological modeling, Runoff, Nash and Sutcliffe efficiency and SWAT.

4. References:

- 1. C. W. Dawson and R. L. Wilby, "Hydrological modeling using artificial neural networks. Prog. Phys. Geog. 2001, 25, pp. 80-108.
- T. A. Fontaine, T. S. Cruickshank, J. G. Arnold and R. H. Hotchkiss, "Development or a snowfall-snowmelt routine for mountain-terrain for the soil water assessment tool (SWAT)." J. Hydrol. 2002, 262, pp. 209-223.
- 3. D. B. Beasley, L. F. Huggins and E. J. Monke, "ANSWERS: a model for watershed planning." Trans. ASAE, 1980. pp: 938–944.
- M. A. Nearing, G. R. Foster, L. J. Lane and S. C. Finkner, "A process-based soil erosion model for USDA-water erosion prediction project technology." 1989. Trans. ASAE, 32 (5), pp: 1587–1593.
- 5. R. K. Misra and C. W. Rose, "Manual for use of program GUEST." Division of Australian Environmental Studies Report. Griffith Univ., Brisbane, Australia, Queensland. 1990.
- 6. R. P. C. Morgan, J. N. Quinton, R. E. Smith, G. Govers, J. W. A. Poesen, K. Auerswald, G. Chisci, D. Torri and M. E. Styczen, "The European soil erosion model (EUROSEM): a dynamic approach for predicting sediment transport from fields and small catchments." Earth Surface Processes and Landforms, 1998. 23, pp: 527–544.
- 7. A. P. J. De Roo and R. J. E. Offermans, "LISEM: a physically-based hydrological and soil erosion model for basin-scale water and sediment management." Proc. Boulder Symp., 1995. IAHS Publ. no. 231. pp: 399-407.
- 8. G. J. Arnold, R. Srinivasan, R. S. Muttiah and J. R. Williams, "Large area hydrologic modeling and assessment Part I: Model development." J. Am. Water Resour. Assoc. 34. 1998. (1), pp; 73–89.
- 9. J. E. Nash and J. V. Sutcliffe, "River flow forecasting through conceptual models, Part-1: A discussion of principles". J. Hydrol. 1970. 10 (3), pp: 282–290.
- 10. S. A. Glantz and B. K. Slinker, "Primer of Applied Regression and Analysis of Variance." McGraw-Hill, Vol.07, 1990. pp: 407-412.

9-11

Authors:	V. S. Malunjkar, M. G. Shinde, A. A. Atre, V. N. Barai
Paper Title:	Assessment of Runoff and Sediment Yield from a Small Agricultural Watershed

Abstract: Runoff and soil erosion are very important processes need to be consider during watershed planning and management and are often non-linear and scale dependent, which complicate runoff and erosion modeling at the catchment scale. One of the reasons for scale dependency is the influence of sinks, i.e. areas of infiltration and sedimentation, which lower hydrological connectivity and decrease the area-specific runoff and sediment yield. The simulation models are useful tools for prediction of runoff and soil erosion at plot scale to catchment scale. Various predictive models have been developed by various researchers for predicting runoff and sediment yield from watersheds. The objective of this study was to model runoff and sediment yield for a small watershed using a coupled approach based on Natural Resources Conservation Service Curve Number (NRCS-CN) method and the Universal Soil Loss Equation (USLE). The results showed that the coupled approach of NRCS-CN and USLE model accurately simulate runoff and sediment yield from the study area.

Keywords: Runoff, erosion, simulation, universal soil loss equation.

References:

5.

- G. R. Foster and L. D. Meyer, "A closed-form soil erosion equation for upland areas", In: Shen, H.W. (Ed.), Sedimentation Symp. in Honor Prof. H. A. Einstein. Colorado State University, Fort Collins, CO, 1972. pp: 12.1–12.19.
- V. Novotny and G. Chesters, "Delivery of sediment and pollutants from nonpoint sources: a water quality perspective". J. Soil and Water Cons., 1989. pp: 568-576.

M. S. Reddy, "Theme paper on Water: Vision 2050." Ind. Water Resour. Soc. Roorkee, 1999. pp: 51–53. 3

- NBSSLUP, National Bureau of Soil Survey and Land Use Planning. Land. "Degradation Scenario of India and Programmes/Schemes for development of degraded lands". Unpublished report.
- D. B. Beasley, L. F. Huggins and E. J. Monke, "ANSWERS: a model for watershed planning". Trans. ASAE, 1980, pp: 938-944.
- R. A. Young, C. A. Onstad, D. D. Bosch and W. P. Anderson, "AGNPS: a nonpoint-source pollution model for evaluating agricultural watersheds". J. Soil and Water Cons., 1989. pp: 168-173.
- M. A. Nearing, G. R. Foster, L. J. Lane, and S. C. Finkner, "A process-based soil erosion model for USDA-water erosion prediction project technology". Trans. ASAE, 1989. 32 (5), pp. 1587-1593.
- G. J. Arnold, R. Srinivasan, R. S. Muttiah and J. R. Williams, "Large area hydrologic modeling and assessment Part I: Model development". J. Am. Water Resour. Assoc. 1998. 34 (1), pp: 73-89.
- 9. S. K. Mishra, J. V. Tyagi, V. P. Singh and R. Singh, "SCS-CN-based modeling of sediment yield", J. Hydrol. 2006. 324, pp: 301-322.

 10. USDA, "Urban hydrology for small watersheds". United States Department of Agriculture. Natural Resources Conservation Service. Conservation Engineering Division. Tech. Release 55. 2nd ed. Washington, DC. 1986. P. 164.
- W. H. Wischmeier and D. D. Smith, "Predicting rainfall erosion losses from cropland east of the Rocky Mountains: Guide for selection of practices for soil and water conservation." U.S. Department of Agriculture handbook No. 537. 1965.
- A. A. Atre, A. S. Damale and G. B. Bangal, "Estimation of erosion index at Rahuri (Maharashtra)". J. Maharashtra Agric. Uni. 1997. 22 (2). pp: 221-222.
- R. K. Singh, R. K. Panda, K. K. Satapathy and S. V. Ngachan, "Simulation of runoff and sediment yield from a hilly watershed in the eastern Himalaya, India using the WEPP model." J. Hydrol. 2011. 405, pp. 261–276.
- J. Martinec and A. Rango, "Merits of statistical criteria for the performance of hydrologic models". Water Resour. Bull. AWRA, 1989. 25 (20), pp: 421-432.
- J. E. Nash and J. V. Sutcliffe, "River flow forecasting through conceptual models, Part-1: A discussion of principles". J. Hydrol. 1970. 10 (3), pp: 282–290.

(b), pp. 202 25 0.					
Authors:	Bankar Kartik, Joshi Bhargav, Mungal Mahajan, Subhash Rathod				
Paper Title:	NFC Based Android API Healthcare System				

Abstract: With the recent increase in usage of mobile devices especially in developing countries, they can be used for an efficient healthcare management. In this work, we have proposed a novel architecture for improving health care system with the help of Android based mobile devices with NFC and Bluetooth interfaces, smartcard technology on tamper resistant secure element (SE) for storing credentials and secure data, and a Health Secure service on a hybrid cloud for security and health record management. The main contribution of this paper is proposal of applications for: i) Secure Medical Tags for reducing medical errors and ii) Secure health card for storing Electronic Health Record (EHR) based on Secure NFC tags, mobile device using NFC P2P Mode. Since NFC NDEF format is prone to security attacks [2], we have utilized low level APIs on Android based mobile devices, to securely access NFC tags such as MIFARE. Simple touch of NFC enabled mobile devices can benefit both the patient as well as the medical doctors by providing a fast and secure health flow. It can also provide portability of devices and usability for health management in emergency situation, overpopulated hospitals and remote locations.

Keywords: Android based mobile devices, NFC, Bluetooth interfaces, secure element (SE), Electronic Health Record (EHR), NFC P2P Mode, MIFARE.

21-22

References:

- Vedat Coskun, Busra Ozdenizci and Kerem Ok, "A Survey on Near Field Communication (NFC) Technology", J. Wireless Personal Communications: An International Journal, vol. 71, pp. 2259-2294, 2013.
- M. Roland and .I. Langer, "Digital Signature Records for the NFC Data Exchange Fonnat", IEEE Proceedings of the Second International Workshop on Near Field Communication (NFC), pp, 71-76, 2010.
- Ryan W. Gardner, Sujata Garera, Matthew W. Pagano, Matthew Green, and Aviel D. Rubin, "Securing medical records on smart phones", Proceedings of the first ACM workshop on Security and privacy in medical and home-care systems, pp. 31-40,2009.
- Lahtela, A., Hassinen, M.and .Iylha, V., "RFID and NFC in healthcare: Safety of hospitals medication care", IEEE proceedings on Pervasive Computing Technologies for Healthcare, pp. 241-244, 2008.
- Saroj Kumar Panigrahy, Sanjay Kumar Iena, and Ashok Kumar Turuk, "Security in Bluetooth, RPID and wireless sensor networks", ACM Proceedings on 2011 International Conference on Communication, Computing Security, pp. 628-633,2011.
- Sebastian Dunnebeil, Felix Kobler, Philip Koene, Ian Marco Leimeister, and Helmut Krcmar, "Encrypted NFC Emergency Tags Based on the German Telematics Infrastructure", IEEE proceedings on Near Field Communication (NFC), 2011 3rd International Workshop, pp. 50-55.IEEE Press, 2011.

- 7. Adam Marcus'o Guido Davidzony, Denise Law, Namrata Venna, Rich Fletcher, Aamir Khanz and Luis Sannenta, "Using NFC-enabled Mobile Phones for Public Health in Developing Countries", IEEE Proceedings on First International Workshop.
- 8. Divyashikha Sethia, Shantanu .lain and Himadri Kakkar, "Automated NFC enabled Rural Healthcare for reliable patient record maintenance", Proceedings of Global Telehealth Conference, vol. 182, pp. 104-113, 2012.
- Sasikanth Avancha, Amit Baxi, and David Kotz, "Privacy in mobile technology for personal healthcare", ACM Computing Surveys (CSUR), vol. 45 Issue I, article 3, 2012.

	Authors:	Nibedita Priyad Sahu	lars	hini Moh	apatra, Ad	yasa Moha	nty,]	Prajna Par	imita Pra	adhan, Sasr	nita K	umari
•	Paper Title:	Enhancement Communication		Energy	Efficient	Protocol	for	Wireless	Sensor	Network	with	Improved

Abstract: Wireless sensor network (wsn) is now the center of attraction for most of the research peoples due to its wide range of applications in almost every field. Where human intervention is impossible, wsn was reachable. It has lots of challenges and issues; we wish to solve the energy budget and also try to provide an improved communication in wireless sensor network. Here we proposed an energy efficient model for wsn which was an enhanced energy efficient routing and clustering approach. This model improves the lifetime of the network with enhanced energy efficiency and improved communication. Here we compare our model with existing protocol and by the simulation results we can say our model performs better than the existing model. Here we also propose a Energy saving data gathering method for wsn with less energy consumption and faster data transmission. The simulation results reflect the idea very well.

Keywords: Sensor network, clustering, routing, energy efficient.

7. References:

1. Networking Networking Wireless Sensors by Bhaskar Krishnamachari , 2005.

2. Wireless Sensor Networks - An Introduction by QinghuaWang and Ilangko Balasingham.

3. System Architecture for Wireless Sensor Networks by Jason Lester Hill, University of California, Berkeley, 2003.

- 4. A Survey of Wireless Sensor Networks Technology by I. Khemapech, I. Duncan and A.Miller, School of Computer Science, University of St Andrews, North Haugh, St Andrews.
- 5. Ossama Younis and Sonia Fahmy 2004.Distributed Clustering in Ad-hoc sensor Networks.A Hybrid Energy Efficient Approach. In Proceedings of IEEE INFOCOM.Hong Kong, an extended version appeared in IEEE Transactions on mobile computing.3 (4).
- W. heinzelman, A. Chndrakasan and H. Balakrishnan 2000. Energy Efficient Communication Protocol Wireless Microsensor Networks. Proceedings of the 33rd Hawaii international Conference on System Sciences (HICSS'00).
- 7. A. Manjeshwar and D. P. Agarwal 2001.TEEN: a routing protocol for enhanced efficiency in wireless sensor networks. In 1st International Workshop on Parallel and Distributed Computing Issues in Wireless Networks and Mobile Computing.
- 8. Manjeshwar and D. P. Agarwal 2002. APTEEN: A Hybrid protocol for efficient routing and comprehensive information retrieval in wireless sensor networks. Parallel and Distributed Symphosium, Proceedings International, IPDPS, pp. 195-202.
- 9. Data Fusion Improves the Coverage of Wireless Sensor Networks by Guoliang Xing1; Rui Tan2; Benyuan Liu3; Jianping Wang2; Xiaohua Jia2; Chih-Wei Yi4, 1Department of Computer Science & Engineering, Michigan State University, USA.
- 10. Routing Protocols in Wireless Sensor Networks –A Survey Shio Kumar Singh 1, M P Singh 2, and D K Singh 3. Routing Techniques in Wireless Sensor Networks: A Survey¤,Jamal N. Al-Karaki Ahmed E.Kamal Dept. of Electrical and Computer Engineering Iowa State University, Ames, Iowa50011.

Authors: P. Gowtham Kumar, P. Chandrasekhar, K. V. R. S. Santhosh Paper Title: Study on Dual Band Double Layered Substrate Microstrip Fork Antenna

Abstract: The design of dual band double layered substrate fork shaped microstrip antenna has been proposed. The proposed antenna operates in Ku Band and can be used in satellite communications particularly for editing and broadcasting satellite television. The dimensions of this antenna are 40 x 40 x (h+h1) mm, where h=0.8mm is the thickness of substrate1 and h1=2mm is the thickness of substrate2 and h+h1 is the total thickness of the substrate. FR4 (lossy) material is used as substrate1 and RogersRT6006 (lossy) material is used as substrate2. Copper (annealed) metal is used as both ground plane and the patch. The proposed antenna operates at two frequencies and the frequencies are 14.33 and 13.823GHz. The return losses are -46.319426dB and -40.421846dB at frequencies 14.33 and 13.823GHz. The directivities of the proposed antenna are 8.001 and 7.962dBi at frequencies 14.33 and 13.823GHz.

Keywords: Antenna, fork antenna, Dual Band, Double Substrate, Return Loss, VSWR, Directivity.

8. References

1. Constantine A. Balanis, "Antenna Theory: Analysis and Design", John Wiley & Sons, Inc., Second Edition, 1997.

- 2. Z. Zakaria, W. Y. Sam and et.al, "Rectangular Microstrip Patch Antenna Based on Resonant Circuit Approach", IEEE Symposium on Wireless Technology and Applications, September 23-26, 2012, Bandung, Indonesia
- 3. Yang F., Xue-Xia Zhang and et.al, "Wide-band E-shaped patch antennas for wireless communications," IEEE Trans. on Antennas and Propogation, Vol.49, No.7, Jul 2001.
- Zahraoui, J. Terhzaz and et.al, "Design and Analysis of a New Dual-Band Microstrip Fractal Antenna", International Journal of Electrical, Computer, Electronics and Communication Engineering Vol.9, No.1, 2015.
- Trupti Ingale , Chaitali Ingale , A.A.Trikolikar , Gunjan Rathore and P.C.Latane," Effect of Different Substrate Material on Performance of H Shaped Patch Antenna," International Journal of Innovative Research in Computer and Communication Engineering, Vol. 2, Issue 11, November 2014.
- 6. Ritu, Krishan Sherdia," Microstrip Antenna Design for UWB Applications," International Journal of Advanced Research in Computer and Communication Engineering, Vol. 2, Issue 10, October 2013.
- 7. Thana Pakkiam .K, JS. Mandeep and M.T Islam," Design of Microstrip Antenna for Modern Wireless Communication," 1st IEEE International Symposium on Telecommunication Technologies.
- 8. Amit A. Deshmukh, M.Mansi, A.Amrita and K. P. Ray," Broadband Proximity fed Equilateral Traingular Microstrip Antenna," 2012 International Conference on Advances in Computing and Communications.

23-27